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TITLE: Polishing apparatus including thickness or flatness detector

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The polishing rate which will change with time during a polishing process can be found by detecting a change of the thickness of the surface layer of the semiconductor wafer at a specified spot with respect to an elapsed time when a

polishing process is effected. A constant polishing rate can be obtained by controlling the operating parameters (such as pressure exerted by the top ring or rotational speeds of the turntable and the top ring) of the polishing apparatus on the basis of the obtained data. Further, a service life of the polishing cloth can be judged or estimated, and a dressing parameter for dressing the polishing cloth after the polishing process can be also determined. By detecting a change of the thickness of the surface layer of the semiconductor wafer at a plurality of spots radially spaced from one another with respect to an elapsed time when a polishing process is effected, the profile of the polished surface of the semiconductor wafer can be controlled during the polishing process using an adjusting mechanism for adjusting a pressure applied to an upper surface of the semiconductor wafer.